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Success Story

SCRAMJET TESTING REACHES MAJOR MILESTONE



A collaborative team of researchers from the Propulsion Directorate and Pratt & Whitney achieved a major development milestone in demonstrating a hydrocarbon-fueled, supersonic combustion ramjet, or scramjet engine. Such propulsive power will enable weapons that will dramatically increase range and decrease the reaction time when employed against high-value targets at long standoff ranges.



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Accomplishment

Built under the Propulsion Directorate's Hypersonic Technology (HyTech) program, the Performance Test Engine (PTE), an integrated engine with inlet, combustor, and nozzle, successfully completed a series of free jet tests. Pratt & Whitney developed this heavyweight, heat-sink demonstrator engine under contract to the directorate. The directorate conducted the tests in the GASL facilities at Ronkonkoma, New York. The PTE met or exceeded performance goals.

The next step and culmination of the HyTech program will be the flightweight ground demonstration engine. Pratt & Whitney will fabricate this integrated scramjet engine with fuel-cooled structures to demonstrate the performance, operation, and structural durability of this flight-type test engine.

Background

The HyTech program is the latest in a long series of Air Force efforts to prove the viability and utility of the scramjet engine. The program establishes a scramjet technology base with near-term applications to hypersonic cruise missiles. The directorate can expand this technology base to include reusable hypersonic vehicles such as strike/reconnaissance and affordable access to space vehicles.

By maturing scramjet propulsion, researchers will provide a key component to a new breed of propulsion systems known as the combined cycle engines. These engines, made from some combination of turbine, ramjet, scramjet, and rocket engines, use each of the different cycles to the fullest advantage of their respective efficiencies to optimize overall system performance. Such propulsion systems have the potential to enable a family of vehicles, including global range, high-speed aircraft, and spaceplane-type vehicles, for on-demand access to space.

Propulsion
Emerging Technologies

Additional information

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